

PCT

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
 (PCT Article 36 and Rule 70)



Applicant's or agent's file reference 20124WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA416)	
International application No. PCT/NL 03/00259	International filing date (day/month/year) 07.04.2003	Priority date (day/month/year) 11.04.2002
International Patent Classification (IPC) or both national classification and IPC C08L23/04, C08L23/04		
Applicant DSM N.V.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 16.10.2003	Date of completion of this report 22.04.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Bergmans, K Telephone No. +31 70 340-4189 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/NL 03/00259**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-10 as originally filed

Claims, Numbers

1-5 filed with telefax on 08.04.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/NL 03/00259**

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-5
Inventive step (IS)	Yes: Claims	
	No: Claims	1-5
Industrial applicability (IA)	Yes: Claims	1-5
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item 1

Basis of the opinion

All amendments are allowable under article 19(2)PCT

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Novelty (Art. 33 (2) PCT)

1.The document D1 (WO0077078) discloses a polymer composition comprising a polyethylene-octene copolymer made by a metallocene catalyst, a modified polyethylene-octene copolymer (wt% maleic acid 0.3 and 3 wt%), and a polyamide 6. The difference with the present application is the amount of the base polymer present in the composition.

2.The document D2 (EP0866081) discloses a thermoplastic resin composition (claims 28 and 29) comprising a graft modified polyolefin resin (A), a thermoplastic resin like polyamide 6 (B), and 1-100 parts by weight of an unmodified olefinic resin in 100 parts by weight of thermoplastic resin containing A and B. The difference with the present application is the amount of the base polymer present in the composition.

3. The document D3 (US6117561) discloses a mixture comprising a first matrix containing at least one member of the group polyolefin (A1) and a functionalised polyolefin (A2) and a second matrix comprising polyamide (claim 1). The polyolefin (A1) can be a polyethylene copolymer or very low density polyethylene (plastomer) prepared with a metallocene catalyst (Column 3 lines 18-30). The functionalised polyolefin (A2) which can be an ethylene copolymer or high density polyethylene, is modified with maleic acid in a percentage between 0.01-5 % by weight (Column 3 lines 58-61). The polyamide in the second matrix can be polyamide 6 (claim 6). The mixture is prepared by first melt mixing ethylene copolymer (A1) and functionalised polyolefin (A2) in an amount of 100-75 % of the polyolefin (A1) and 0-25 % of the functionalised polyolefin (A2). This blend forms the first matrix. Secondly, the polyamide (second matrix) is melt mixed with the first matrix. The polyamide (second matrix) is dispersed in the first matrix (claim 1 , point ii). The ratio between the first and second matrix is 5/95 to 95/5 (claim 14). The subject matter of claims 1-5 over document D3 is considered to be not novel (Art. 33(2) PCT).

Inventive step (Art. 33(3) PCT)

All the technical features of the present claims are described in D3. Moreover, D3 relates to an alternative composition comprising a plastomer, modified plastomer and polyamide. Therefore the claims 1 to 5 do not involve an inventive step (Art. 33(3) PCT).

Re Item VIII

Certain observations on the international application

Clarity (Art. 6 PCT)

The subject-matter of claim 2 is not novel since the claim defines a product by its process of manufacture. Product by process claims are only allowable if the product as such is novel and inventive. No specific features of the polymer composition of claim 2 is given that makes the product as such novel.

Enclosure 1.

AMENDED CLAIMS

1. Method for preparation of a polymer composition at least comprising as main components
 - a polyolefin polymer grafted with an ethylenically unsaturated functionalised compound with at least a first functional group;
 - a reactive thermoplastic polymer with a second functional group which can react with the first; and
 - a base polymer, characterised in that the base polymer comprises at least 55 wt% of a single site catalyst polymerised polyolefin, and in that the base polymer and the polyolefin polymer, grafted with the ethylenically unsaturated functionalised compound in an amount of between 0.05 and 1.0 mgeq/g, are mixed with each other in the molten state, after which the resulting molten mixture is mixed in the melt with the reactive thermoplastic polymer, the proportion of the base polymer amounting to ~~more than 50 wt%, preferably to at least 55 wt%~~ and the proportion of the reactive thermoplastic polymer to at least 10 wt% of the total of the main components and the proportion of the reactive thermoplastic polymer amounting ~~amounts~~ to more than 50 wt% of the total of the reactive thermoplastic polymer and the polyolefin polymer grafted with an ethylenically unsaturated functionalised compound.
2. Polymer composition, obtainable according to the method of claim 1, comprising as main components
 - a polyolefin polymer grafted with an ethylenically unsaturated functionalised compound with at least a first functional group;
 - a reactive thermoplastic polymer with a second functional group which can react with the first; and
 - a base polymer comprising at least 55 wt% of a single site catalyst polymerised polyolefin, wherein the proportion of the base polymer amounts to ~~more than 50, preferably to at least 55 wt%~~ and the proportion of the reactive thermoplastic polymer to at least 10 wt% of the total of the main components, and wherein the proportion of the reactive thermoplastic polymer amounts to more than 50 wt% of the total of the reactive thermoplastic polymer and the polyolefin polymer grafted with an ethylenically unsaturated functionalised compound and wherein the quantity of the ethylenically unsaturated functionalised compound in the grafted polyolefin polymer is between 0.05 and 1.0 mgeq/g.
3. Polymer composition according to claim 2, in which the base polymer is polyethylene.
4. Polymer composition according to claim 2 or 3, in which the base polymer is a plastomer.
5. Polymer composition according to any one of claims 1-3, in which the reactive polymer is a polyamide.